

REMARKS

Claims 9, 13-17 and 20-22 were pending in this application. This Amendment cancels Claim 13 without prejudice and amends Claim 14 to include the limitations of canceled Claim 13, hence Claims 9, 14-17 and 20-22 are currently pending. No new matter has been added.

The Examiner has indicated that the effective filing date of present Claim 9 is October 16, 2003 because the provisional application No. 60/418,930 does not provide adequate support for the present compound 2-benzyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1. Applicant traverses.

While it is true that 2-benzyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1 is not specifically mentioned in the Provisional Patent, such defines photoinitiators broadly in the first paragraph of page 5 (reproduced in pertinent part below) and provides citations 8 and 9 for specific identification of materials and methods employed.

These photosensitive norbornene copolymer sacrificial materials consist of formulations of copolymers of pendant butyl- and alkenyl-substituted norbornenes (PNB) with small additions of a photoinitiator (PI) to selectively induce crosslinking. The photolithographic characteristics, photoinitiation systems, and thermal decomposition properties of these sacrificial materials has been systematically investigated in previous studies.^{8,9} These experimental results provide the basic information required for the fabrication of microchannels using these sacrificial materials.

Therefore, Applicant respectfully asserts that 2-benzyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1, having the Trade Name Irgacure 369 was disclosed in the originally filed Provisional Patent and thus has an effective filing date of October 16, 2002.

35 U.S.C. §102 Rejections

Teng

The Examiner has finally rejected Claim 9 under 35 U.S.C. § 102(b) for anticipation by newly cited U.S. Patent No. 6,410,208 to Teng (hereinafter “the Teng patent”). Specifically, the Examiner asserts that such patent teaches (see Example 5) a thermo-deactivatable photosensitive layer comprising a thermo-deactivatable photopolymer formulation and a photoinitiator, namely 2-benzyl-2-N,N-dimethylamino-1-(4-morpholinophenyl)-1-butanone. Applicant traverses the Examiner’s rejection.

For a rejection under 35 U.S.C. § 102 to be properly made and sustained, the art cited in that rejection must disclose each and every element of the claim(s) called out in the rejection.

MPEP §2131:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Applicant respectfully asserts that the Teng patent fails to meet this requirement. Specifically, the Teng patent does not disclose or teach the "photodefinable polymer including a thermally decomposable sacrificial polymer" recited in the instant claim, but rather teaches a "thermo-deactivatable photosensitive layer" that is used to coat lithographic printing plates. As described by the Teng patent, "[a]ccording to the present invention, there has been provided a lithographic printing plate comprising on a substrate a thermo-deactivatable photosensitive layer, said photosensitive layer being photohardenable before exposure to an infrared radiation and being capable of becoming non-photohardenable or having reduced rate of photohardening in the exposed areas upon exposure to an infrared radiation, wherein said photosensitive layer exhibits an affinity or aversion substantially opposite to the affinity or aversion of said substrate to at least one printing liquid selected from the group consisting of ink and an adhesive fluid for ink. The term photohardenable in this patent means capable of hardening upon exposure to an actinic radiation." (column 4, lines 1-13). Thus, the concept of a thermally decomposable sacrificial polymer is a concept that is totally absent from the Teng patent.

In view of the foregoing, Applicant respectfully asserts that the rejection of Claim 9 is not sustainable and must be withdrawn, such action is earnestly sought. Accordingly, Applicant respectfully asserts that the Teng patent does NOT meet the requirement stated in MPEP §2131, and thus CANNOT be the basis of a rejection of instant Claim 9.

Mastrangelo et al.

The Examiner has finally rejected Claims 20-22 under 35 U.S.C. § 102(b) for anticipation by newly cited U.S. Patent No. 6,136,212 to Mastrangelo et al. (hereinafter "the

‘212 patent’). Specifically, the Examiner asserts that such patent teaches (see Fig. 3) a microfluidic device with an open channel. Further, the Examiner asserts that since present Claims 20-22 are written in product-by-process claim languages, the microfluidic device of the ‘212 patent teaches the present invention of Claims 20-22. Applicant disagrees that such a device teaches the inventions of Claims 20-22, since as stated by MPEP §2113 the products must be the same or must be obvious: “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Applicant respectfully asserts that the product of the ‘212 patent is NOT the same or is obvious from the product of the instant claims.

Specifically, the ‘212 patent discloses a basic fabrication process of a microfluidic component that “begins with a conventional silicon CMOS process substrate, as shown in Fig. 3. In this figure, inlet and outlet are etched from the front side. However, backside inlet and outlet can easily be made by etching holes into the substrate from the backside using an anisotropic etchant...” (column 5, lines 56-61). Fig. 3 of the ‘212 patent shows a process where a thick polymer layer is deposited and photolithographically defined onto the substrate. Next, a second polymer layer is deposited serving as the walls of the channels. The second polymer is next etched defining the extent of the channel walls. Holes to polymer 1 can be etched either from the front or through the backside by plasma etching the passivation oxide (see Section III). Polymer 1 is then sacrificially etched leaving a channel behind. (See column 5, line 66 to column 6, line 9).

The processes referred to in present Claims 20-22 all share a thermal decomposition step where the decomposition products diffuse through a solid contiguous layer that overlies the sacrificial polymer. In contrast, the process of the ‘212 patent teaches that either the substrate or the overcoat layer on the substrate (i.e., passivation oxide layer such as silicon dioxide) requires the forming of inlets and outlets to allow for the etchant to reach and remove the sacrificial layer (i.e., Polymer 1). Therefore, since the structure formed by any of Claims 20-22 of the instant application is absent the inlets and outlets of the ‘212 patent, such claimed structure is NOT the same as or made obvious by the ‘212 patent. Applicant asserts, therefore, that the present rejection cannot be sustained as it does not meet

the requirement of MPEP §2113. Accordingly, withdrawal of the rejection of Claims 20-22 is requested.

35 U.S.C. §103 Rejections

Mastrangelo et al.
Lee et al.

The Examiner has finally rejected Claims 13-17 and 20-22 under 35 U.S.C. § 103(a) for obviousness over Mastrangelo et al. (the ‘212 patent) and in view of newly cited U.S. Patent No. 6,107,000 to Lee et al. (hereinafter “the ‘000 patent”). As Claim 13 has been canceled, without prejudice, by this amendment, the rejection of such claim is moot. Applicant will therefore respond herein to the rejection of Claims 14-17 and 20-22.

In the current Action, the Examiner asserts that the ‘212 patent teaches the claimed method except for the use of a gray scale photomask. The Examiner combines the ‘212 patent with the ‘000 patent for the asserted teaching of the use of a gray scale mask in fabricating micro-devices in order to avoid alignment errors resulting from processes requiring the use of a binary mask. Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to use a gray scale mask in exposing the photoresist material (the first polymer layer) of the ‘212 patent to form the three dimensional structure formed onto a substrate so as to avoid the alignment errors as taught by the ‘000 patent.

The method as set forth in amended independent Claim 14 includes, in pertinent part, “decomposing the photodefinable polymer composition, thermally, to form a three-dimensional air-region” (emphasis added).

For a rejection under 35 U.S.C. § 103(a) to be properly made and sustained, it is well established that all claim limitations must be considered in judging the patentability of that claim against the prior art.

“MPEP §2143.03:

“All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA) 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

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The '212 patent teaches a process for forming channels that requires the forming of inlets and outlets to allow for an etchant to reach and remove a sacrificial layer. The '212 patent DOES NOT teach or suggest the thermal decomposition of a sacrificial layer.

The method of the '000 patent provides for fabricating a three-dimensional micro-optic lens on a substrate coated with a photoresist layer. Such layer is first exposed to an electron beam and subsequently etched by chemically assisted ion beam milling. As was stated above for the '212 patent, the '000 patent DOES NOT teach or suggest the thermal decomposition of a sacrificial layer.

Therefore, Applicant respectfully asserts that since neither the '212 patent nor the '000 patent, taken singly or in any combination thereof, teaches or even suggests thermally decomposing a sacrificial layer, the Examiner must not have appropriately considered all the words of the instant claims as is required by MPEP § 2143.03, in deciding to reject the instant claims. Hence, withdrawal of this rejection and allowance of independent Claims 14-17 and 20-22, is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that all of the pending claims in the present application are in condition for allowance as currently presented. Accordingly, withdrawal of the pending rejections and an early Notice of Allowance are respectfully requested.

Respectfully submitted,

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